WHAT IS CLAIMED IS:

1. A discharge structure for dispensing liquid from a supply of said liquid, said structure comprising:

a discharge conduit defining a flow passage for establishing fluid communication with said liquid from said supply of said liquid;

a resilient, pressure-actuatable valve that (1) extends across said discharge conduit flow passage in an initial, substantially non-deformed, closed configuration, (2) has an interior side for being contacted by said liquid and an exterior side exposed to the ambient external atmosphere, (3) has a head defining part of said interior side and defining a normally self-sealing closed orifice, and (4) a sleeve defining part of said interior side and extending from the periphery of said valve head to accommodate movement of said valve head outwardly to an open configuration when the pressure on a portion of said valve interior side exceeds the pressure on said valve exterior side by a predetermined amount; and

a restraint structure disposed in said discharge conduit in contact with said valve interior side at said valve head when said valve is in said initial, substantially non-deformed, closed configuration, said restraint structure and said discharge conduit together defining at least one flow path for initially accommodating flow of said liquid from said supply against a portion of said valve interior side at said valve sleeve laterally beyond said valve head, said restraint structure preventing said closed orifice from opening inwardly when the ambient external pressure on the valve exterior side exceeds the pressure on the valve interior side.

2. The discharge structure in accordance with claim 1 in which

said interior side of said valve head includes a central flat surface and a peripheral curved surface;

said orifice is defined by slits through said valve head which extend laterally from said valve head central flat surface into said valve head peripheral curved surface; and

said restraint structure defines (1) an imperforate, central, flat engaging surface for matingly engaging said valve head central flat surface, and (2) an imperforate, peripheral curved surface for matingly engaging said valve head peripheral curved surface from said valve head flat surface to a location that is at least laterally beyond said slits.

3. The discharge structure in accordance with claim 1 in which said discharge conduit includes an annular wall merging with the periphery of said restraint structure via a plurality of connecting legs to define a plurality of flow passages accommodating flow against said valve interior side at said valve sleeve laterally beyond said valve head.

4. The discharge structure in accordance with claim 1 in which said discharge conduit is part of a pump having a pressurizable reservoir for containing a supply of said liquid.

5. A peripheral mounting flange for a resilient, pressure-actuatable valve that can discharge a fluid product in an outward flow direction and that has a head defining a normally self-sealing closed dispensing orifice and having a sleeve extending from the periphery of said head, said peripheral mounting flange being adapted for being retained by a retention wall that is inelastically deformed against said peripheral mounting flange, said peripheral mounting flange comprising:

resilient material extending from the periphery of said sleeve in a generally annular configuration about a longitudinal axis that extends axially inwardly and axially outwardly relative to said flow direction, said generally annular configuration being located around and radially outwardly of said longitudinal axis, said resilient material having a surface region defined at least in part by the following surfaces:

a first surface extending generally axially outwardly from said sleeve;

a second surface extending generally axially inwardly from said sleeve;

a third surface extending both generally axially outwardly and radially outwardly from said first surface; and

a fourth surface extending both generally axially inwardly and radially outwardly from said second surface so that the third and fourth surfaces generally diverge.

6. The valve peripheral mounting flange in accordance with claim 5 further including:

a fifth surface extending both generally axially inwardly and radially outwardly from said third surface.

7. The valve peripheral mounting flange in accordance with claim 6 further including:

a sixth surface extending both generally axially outwardly and radially outwardly from said fourth surface.

8. The valve peripheral mounting flange in accordance with claim 7 further including:

a seventh surface extending generally axially outwardly from said sixth surface; and

an eighth surface extending generally axially inwardly from said seventh surface.

9. The valve peripheral mounting flange in accordance with claim 8 further including:

a ninth surface extending generally axially outwardly from said eighth surface; and

a tenth surface extending generally radially inwardly from said ninth surface.

10. A diaphragm pump comprising:

(A) a diaphragm of resilient material molded to define

(1) a resiliently deformable, pressurizing portion that (a) has an undeformed convex configuration as viewed from the exterior, and (b) defines a concave receiving region as viewed from the interior for pressurizing fluid;

(2) a connecting member extending from the periphery of said pressurizing portion; and

(3) a mounting flange that (a) extends generally radially from the periphery of said connecting member, (b) is thicker than said connecting member, (c) has a first surface extending outwardly from said connecting member in the direction toward the exterior, and (d) has a second surface extending inwardly from said connecting member in the direction away from the exterior; and

B. a pump housing defining an inlet and outlet and further including a retention structure for retaining said diaphragm mounting flange, said retention structure including a projecting wall that has a lateral surface and an end surface, said wall end surface being spaced from said diaphragm connecting member when said pump is not pressurizing said fluid, said wall lateral surface being spaced from said diaphragm mounting flange second surface when said pump is not pressurizing said fluid whereby assembly of said diaphragm into said pump housing is facilitated.

11. The pump in accordance with claim 10 in which said mounting flange second surface defines a substantially interior cylindrical surface.

12. The pump in accordance with claim 10 in which said connecting member is arcuate.

13. The pump in accordance with claim 10 in which said connecting member defines a convex surface projecting toward, but not engaging, said retention structure projecting wall end surface.

14. The pump in accordance with claim 10 in which at least a portion of said retention structure projecting wall lateral surface is engageable by a portion of said mounting flange when said pump is pressurizing said fluid.

15. A diaphragm for a pump, said diaphragm comprising:

a resilient material molded to define

(A) a resiliently deformable, pressurizing portion that (1) includes an undeformed convex configuration when viewed from the exterior, and (2) defines a receiving region under said convex configuration for receiving fluid that can be pressurized by deforming said pressurized portion;

(B) a stress isolation connecting member extending from the periphery of said pressurizing portion, said stress isolation connecting member having a non-linear cross-sectional configuration; and

(C) a mounting flange that (1) extends from the periphery of said stress isolation connecting member, and (2) can be disposed in a retention structure of said pump.

16. The diaphragm in accordance with claim 15 in which said stress isolation connecting member has an arcuate cross section.

17. The diaphragm in accordance with claim 16 in which said arcuate cross section is of uniform thickness over at least a major portion of its radial length.

18. The diaphragm in accordance with claim 17 in which said arcuate cross section defines a concave annular channel around said pressurizing portion as viewed from the exterior.

19. A diaphragm for a pump having a retention structure that includes an inelastically deformable exterior retention wall, said diaphragm comprising:

a resilient material molded to define

(A) a resiliently deformable, pressurizing portion that (1) has an undeformed convex configuration as viewed from the exterior, and (2) defines a concave receiving region as viewed from the interior for pressurizing fluid; and

(B) a mounting flange that (1) is connected with the periphery of said pressurizing portion, (2) can be disposed in said pump so that said exterior retention wall can be inelastically deformed against said mounting flange, and (3) has a generally annular configuration of resilient material extending from the periphery of said sleeve wherein said material having a surface region defined in part by the following surfaces:

(a) inner and outer diverging surfaces wherein said inner diverging surface is inwardly of the location of the connection of said flange to said pressurizing portion and wherein said outer diverging surface is outwardly of the location of the connection of said flange to said pressurizing portion;

(b) a first corner surface extending from said outer diverging surface;

(c) a laterally extending surface extending from said first corner surface; and

(d) a second corner surface extending from said laterally extending surface.

20. The diaphragm pump in accordance with claim 19 in which said surface region of said generally annular configuration of resilient material

further includes a laterally peripheral surface that has an outer margin and an inner margin wherein said outer margin is located laterally further from said pressurizing portion than is said inner margin.